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EXAMINER	
LEURIG, SHARLENE L	

ART UNIT	PAPER NUMBER
2879	

DATE MAILED: 01/21/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/622,732	WAN ET AL.	
	Examiner	Art Unit	
	Sharlene Leurig	2879	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on *21 July 2003*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-15* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-15* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *21 July 2003* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. §§ 119 and 120

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

13)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application) since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

a) ☐ The translation of the foreign language provisional application has been received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121 since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. Claims 1-6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ketchpel (5,396,406) in view of Zou et al. (6,550942).

Regarding claim 1, Ketchpel discloses a flat lamp structure (Figure 2) comprising a reflecting plate having a reflecting coating formed thereon (24 and 28), a UV light source (26), a transparent substrate (16) with macromolecular polymer (14) and fluorescent powder (30, 32, 34) coated thereon. The UV light source is arranged in the reflecting plate, and the transparent substrate covers the reflecting plate. The UV light emitted by the UV light source is reflected by the reflecting plate, as shown in the figure, and excites the fluorescent powder to radiate visible light.

Ketchpel lacks disclosure of a plurality of UV light sources.

It would have been obvious to one having ordinary skill in the art at the time of the invention to provide additional UV light sources in order to increase the intensity of light, since it has been held that mere duplication of the essential working parts of a device involves only routine skill in the art. *St. Regis Paper Co. v. Bemis Co.,* 193 USPQ 8.

Ketchpel further lacks disclosure of the type of reflective material provided as reflective layer (28) and along the portion of the reflective plate (24).

Zou teaches a reflective layer (Figure 3, element 106) for a UV light source (102). The reflective layer is formed of a macromolecular polymer mixed with titanium dioxide. Zou teaches this type of reflective layer as having very high reflectivity (column 5, line 60 to column 6, line 14).

Therefore it would have been obvious to one having ordinary skill in the art at the time of the invention to modify the flat lamp disclosed by Ketchpel to have multiple light sources in order to increase the intensity of the light emitted from the lamp, and to further modify it to have a reflective layer formed of a polymer mixed with titanium dioxide in order to increase the reflectivity of the reflecting plate, as taught by Zou, and to thereby improve the efficiency of the lamp.

Regarding claim 2, Ketchpel discloses a reflective layer formed on the inner wall of the reflecting plate (Figure 2, elements 24 and 28).

Regarding claim 3, Ketchpel discloses a reflecting plate capable of reflecting UV light (column 4, line 17).

Regarding claim 4, Ketchpel discloses a reflecting plate (28) that is cavity-shaped.

Regarding claim 5, Ketchpel discloses the macromolecular polymer (14) and fluorescent powder (30, 32, 34) being coated on an inner wall of the transparent substrate (16).

Regarding claim 7, Ketchpel discloses the UV light source being a UV lamp tube (column 4, line 14).

3. Claims 1-7 and are rejected under 35 U.S.C. 103(a) as being unpatentable over Cekic et al. (6,505,948) in view of Zou et al. (6,550942) and further in view of Juliano (3,787,238).

Regarding claim 1, Cekic discloses a flat lamp structure (Figure 6) comprising a reflecting plate (110), wherein plate is interpreted as a "sheet of metal or plastic", a UV light source (106), a transparent substrate (116) with fluorescent powder (112) coated thereon. The UV light source is arranged in the arc of the reflecting plate, and the transparent substrate covers the reflecting plate. The UV light emitted by the UV light source is reflected by the reflecting plate, as shown in the figure, and excites the fluorescent powder to radiate visible light (column 4, line 39).

Cekic lacks disclosure of a plurality of UV light sources.

It would have been obvious to one having ordinary skill in the art at the time of the invention to provide additional UV light sources in order to increase the intensity of light, since it has been held that mere duplication of the essential working parts of a device involves only routine skill in the art. *St. Regis Paper Co. v. Bemis Co.,* 193 USPQ 8.

Cekic lacks disclosure of the structure of the reflector, and whether its reflective properties are a result of a reflective coating.

Zou teaches a reflective layer (Figure 3, element 106) for a UV light source (102). The reflective layer is formed of a macromolecular polymer mixed with titanium dioxide. Zou teaches this type of reflective layer as having very high reflectivity (column 5, line 60 to column 6, line 14).

Therefore it would have been obvious to one having ordinary skill in the art at the time of the invention to modify the flat lamp disclosed by Cekic to have multiple light sources in order to increase the intensity of the light emitted from the lamp, and to further modify it to have a reflective layer formed of a polymer mixed with titanium dioxide in order to increase the reflectivity of the reflecting plate, as taught by Zou, and to thereby improve the efficiency of the lamp.

Cekic further lacks disclosure of a polymer formed on the phosphor coated on the substrate.

Juliano teaches a polymer coating (Figure 1, element 5) for a screen having phosphor (4) formed thereon, in order to protect the phosphor from damage from water or abrasion (column 1, lines 34-46).

Therefore it would have been obvious to one having ordinary skill in the art at the time of the invention to modify the flat lamp disclosed by Cekic to have multiple light sources in order to increase the intensity of the light emitted from the lamp, to further modify it to have a reflective layer formed of a polymer mixed with titanium dioxide in order to increase the reflectivity of the reflecting plate, as taught by Zou, and to thereby improve the efficiency of the lamp, and to further modify it with a polymer coating on the phosphor layers in order to protect them from damage, as taught by Juliano.

Regarding claim 2, Cekic discloses a reflector that reflects light from its inner surface. Therefore the modification of a reflective layer being formed on the reflector would necessarily be formed on the inner surface of the reflector.

Regarding claim 3, Cekic discloses a reflecting plate that reflects light emitted from the bulb (106). The bulb emits UV light, which is later converted to visible light by the phosphors. Therefore the reflecting plate is capable of reflecting UV light (column 3, lines 5-40).

Regarding claim 4, Cekic discloses a reflecting plate (110) that is cavity-shaped.

Regarding claims 5 and 6, Cekic discloses the fluorescent powder (112) being coated on both an inner wall and an outer wall of the transparent substrate (116). Therefore the modification of a protective polymer layer formed on the phosphor powder, as taught by Juliano, would be formed on both the inner and outer surfaces of the substrate.

Regarding claim 7, Cekic discloses the UV light source being a UV lamp tube.

4. Claim 8 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ketchpel (5,396,406) in view of Zou et al. (6,550942) as applied to claims 1-5 and 7 above, and further in view of Gleckman (5,684,354) in view of Boerner et al. (6,051,925).

Ketchpel discloses a backlight for an LCD comprising a flat lamp having a UV light source, but lacks disclosure of a reflective layer having a polymer and titanium dioxide.

Zou teaches a reflective layer formed of a macromolecular polymer mixed with titanium dioxide in order to increase UV reflectivity.

Both Ketchpel and Zou lack disclosure of UV light-emitting diodes as the UV light source.

Gleckman teaches that LCDs can be backlit either with tube lamps or LEDs (column 1, lines 9-49).

Gleckman lacks disclosure of LEDs as being UV light emitters.

Boerner teaches an LED that emits UV light and can be used in an LCD (column 2, line 34).

Therefore it would have been obvious to one having ordinary skill in the art at the time of the invention to modify the flat lamp disclosed by Ketchpel to have multiple light sources in order to increase the intensity of the light emitted from the lamp, to further modify it to have a reflective layer formed of a polymer with titanium dioxide mixed in, in order to increase the reflection of UV light emitted from the source, as taught by Zou, to further modify it to have a light source that is an LED array, as taught by Gleckman, in order to make a device that weighs less, and to further modify it so that the LEDs emit UV light, as taught by Boerner, in order to provide the desired luminescence.

5. Claims 9 and 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ketchpel (5,396,406) in view of Zou et al. (6,550942) as applied to claims 1-5 and 7 above, and further in view of West et al. (6,607,286).

Ketchpel discloses a backlight for an LCD comprising a flat lamp having a UV light source and a transparent substrate that is a lens array (16), but lacks disclosure of a reflective layer having a polymer and titanium dioxide.

Zou teaches a reflective layer formed of a macromolecular polymer mixed with titanium dioxide in order to increase UV reflectivity.

Both Ketchpel and Zou lack disclosure of the material forming the transparent substrate.

West teaches that optical lenses may be formed of polymethyl methacrylate or polycarbonate (column 3, lines 49-52).

Therefore it would have been obvious to one having ordinary skill in the art at the time of the invention to modify the flat lamp disclosed by Ketchpel to have multiple light sources in order to increase the intensity of the light emitted from the lamp, to further modify it to have a reflective layer formed of a polymer with titanium dioxide mixed in, in order to increase the reflection of UV light emitted from the source, as taught by Zou, and to further modify it to have a lens array formed of polycarbonate or polymethyl methacrylate, as taught by West, in order to provide a lens array made of a readily available and well-understood material.

6. Claim 11 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ketchpel (5,396,406) in view of Zou et al. (6,550942) as applied to claims 1-5 and 7 above, and further in view of Kaminsky et al. (6,583,936).

Ketchpel discloses a backlight for an LCD comprising a flat lamp having a UV light source and a transparent substrate that is a lens array (16), but lacks disclosure of a reflective layer having a polymer and titanium dioxide.

Zou teaches a reflective layer formed of a macromolecular polymer mixed with titanium dioxide in order to increase UV reflectivity.

Both Ketchpel and Zou lack disclosure of the material forming the transparent substrate.

Kaminsky teaches that optical lenses may be formed of polyethylene terephthalate (column 9, line 7).

Therefore it would have been obvious to one having ordinary skill in the art at the time of the invention to modify the flat lamp disclosed by Ketchpel to have multiple light sources in order to increase the intensity of the light emitted from the lamp, to further modify it to have a reflective layer formed of a polymer with titanium dioxide mixed in, in order to increase the reflection of UV light emitted from the source, as taught by Zou, and to further modify it to have a lens array formed of polyethylene terephthalate, as taught by Kaminsky, in order to provide a lens array made of a readily available and well-understood material.

7. Claim 12 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ketchpel (5,396,406) in view of Zou et al. (6,550942) as applied to claims 1-5 and 7 above, and further in view of Hanelt et al. (5,827,449).

Ketchpel discloses a backlight for an LCD comprising a flat lamp having a UV light source and a transparent substrate that is a lens array (16), but lacks disclosure of a reflective layer having a polymer and titanium dioxide.

Zou teaches a reflective layer formed of a macromolecular polymer mixed with titanium dioxide in order to increase UV reflectivity.

Both Ketchpel and Zou lack disclosure of the material forming the transparent substrate.

Hanelt teaches that optical lenses may be formed of quartz glass (column 21, line 13).

Therefore it would have been obvious to one having ordinary skill in the art at the time of the invention to modify the flat lamp disclosed by Ketchpel to have multiple light sources in order to increase the intensity of the light emitted from the lamp, to further modify it to have a reflective layer formed of a polymer with titanium dioxide mixed in, in order to increase the reflection of UV light emitted from the source, as taught by Zou, and to further modify it to have a lens array formed of quartz glass, as taught by Hanelt, in order to provide a lens array made of a readily available and well-understood material.

8. Claim 13 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ketchpel (5,396,406) in view of Zou et al. (6,550942) as applied to claims 1-5 and 7 above, and further in view of Troxell (5,646,479).

Ketchpel discloses a backlight for an LCD comprising a flat lamp having a UV light source and a transparent substrate that is a lens array (16), but lacks disclosure of a reflective layer having a polymer and titanium dioxide.

Zou teaches a reflective layer formed of a macromolecular polymer mixed with titanium dioxide in order to increase UV reflectivity.

Both Ketchpel and Zou lack disclosure of the material forming the transparent substrate.

Troxell teaches that optical lenses may be formed of a sodium-containing glass (column 4, line 57).

Therefore it would have been obvious to one having ordinary skill in the art at the time of the invention to modify the flat lamp disclosed by Ketchpel to have multiple light sources in order to increase the intensity of the light emitted from the lamp, to further modify it to have a reflective layer formed of a polymer with titanium dioxide mixed in, in order to increase the reflection of UV light emitted from the source, as taught by Zou, and to further modify it to have a lens array formed of sodium-containing glass, as taught by Troxell, in order to provide a lens array made of a readily available and well-understood material.

9. Claim 14 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ketchpel (5,396,406) in view of Zou et al. (6,550942) as applied to claims 1-5 and 7 above, and further in view of Vanderwerf (5,092,672).

Ketchpel discloses a backlight for an LCD comprising a flat lamp having a UV light source and a transparent substrate that is a lens array (16), but lacks disclosure of a reflective layer having a polymer and titanium dioxide.

Zou teaches a reflective layer formed of a macromolecular polymer mixed with titanium dioxide in order to increase UV reflectivity.

Both Ketchpel and Zou lack disclosure of the material forming the transparent substrate.

Vanderwerf teaches that optical lenses may be formed of borosilicate glass (column 3, line 55).

Therefore it would have been obvious to one having ordinary skill in the art at the time of the invention to modify the flat lamp disclosed by Ketchpel to have multiple light sources in order to increase the intensity of the light emitted from the lamp, to further modify it to have a reflective layer formed of a polymer with titanium dioxide mixed in, in order to increase the reflection of UV light emitted from the source, as taught by Zou, and to further modify it to have a lens array formed of borosilicate glass, as taught by Vanderwerf, in order to provide a lens array made of a readily available and well-understood material.

10. Claim 15 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ketchpel (5,396,406) in view of Zou et al. (6,550942) as applied to claims 1-5 and 7 above, and further in view of Yang et al. (CN 1425621 A).

Ketchpel discloses a backlight for an LCD comprising a flat lamp having a UV light source and a transparent substrate that is a lens array (16), but lacks disclosure of a reflective layer having a polymer and titanium dioxide.

Zou teaches a reflective layer formed of a macromolecular polymer mixed with titanium dioxide in order to increase UV reflectivity.

Both Ketchpel and Zou lack disclosure of the material forming the transparent substrate.

Yang teaches that optical lenses may be formed of a lead-sodium-silicate glass, a material which prevents attenuates radiation (Basic-Abstract).

Therefore it would have been obvious to one having ordinary skill in the art at the time of the invention to modify the flat lamp disclosed by Ketchpel to have multiple light sources in order to increase the intensity of the light emitted from the lamp, to further modify it to have a reflective layer formed of a polymer with titanium dioxide mixed in, in order to increase the reflection of UV light emitted from the source, as taught by Zou, and to further modify it to have a lens array formed of lead-sodium-silicate glass, as taught by Yang, in order to provide a lens array that prevents radiation from escaping.

11. Claims 9 and 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Cekic et al. (6,505,948) in view of Zou et al. (6,550942) and further in view of Juliano (3,787,238) as applied to claims 1-7 above, and further in view of West et al. (6,607,286).

Cekic discloses a lamp having a UV light source and a transparent substrate (116), but lacks disclosure of the structure of the reflector, and whether its reflective properties are a result of a reflective coating, and further lacks disclosure of a polymer formed on the phosphor layer.

Zou teaches a reflective layer formed of a macromolecular polymer mixed with titanium dioxide in order to improve reflectivity of UV light.

Cekic further lacks disclosure of a polymer formed on the phosphor coated on the substrate.

Juliano teaches a polymer coating in order to protect the phosphor from damage from water or abrasion.

Cekic, Zou and Juliano lack disclosure of the type of material forming the transparent substrate.

West teaches that materials such as polymethyl methacrylate or polycarbonate can be used to form transparent layers (column 3, lines 49-52).

Therefore it would have been obvious to one having ordinary skill in the art at the time of the invention to modify the flat lamp disclosed by Cekic to have multiple light sources in order to increase the intensity of the light emitted from the lamp, to further modify it to have a reflective layer formed of a polymer mixed with titanium dioxide in order to increase the reflectivity of the reflecting plate, as taught by Zou, and to thereby improve the efficiency of the lamp, to further modify it with a polymer coating on the phosphor layers in order to protect them from damage, as taught by Juliano, and to further modify it to have a transparent window substrate made of a material such as

polycarbonate or PMMA, as taught by West, in order to provide a material that is well understood and readily available.

12. Claim 11 is rejected under 35 U.S.C. 103(a) as being unpatentable over Cekic et al. (6,505,948) in view of Zou et al. (6,550942) and further in view of Juliano (3,787,238) as applied to claims 1-7 above, and further in view of Kaminsky et al. (6,583,936).

Cekic discloses a lamp having a UV light source and a transparent substrate (116), but lacks disclosure of the structure of the reflector, and whether its reflective properties are a result of a reflective coating, and further lacks disclosure of a polymer formed on the phosphor layer.

Zou teaches a reflective layer formed of a macromolecular polymer mixed with titanium dioxide in order to improve reflectivity of UV light.

Cekic further lacks disclosure of a polymer formed on the phosphor coated on the substrate.

Juliano teaches a polymer coating in order to protect the phosphor from damage from water or abrasion.

Cekic, Zou and Juliano lack disclosure of the type of material forming the transparent substrate.

Kaminsky teaches that a material such as polyethylene terephthalate can be used to form transparent layers (column 9, line 7).

Therefore it would have been obvious to one having ordinary skill in the art at the time of the invention to modify the flat lamp disclosed by Cekic to have multiple light

sources in order to increase the intensity of the light emitted from the lamp, to further modify it to have a reflective layer formed of a polymer mixed with titanium dioxide in order to increase the reflectivity of the reflecting plate, as taught by Zou, and to thereby improve the efficiency of the lamp, to further modify it with a polymer coating on the phosphor layers in order to protect them from damage, as taught by Juliano, and to further modify it to have a transparent window substrate made of a material such as polyethylene terephthalate, as taught by Kaminsky, in order to provide a material that is well understood and readily available.

13. Claim 12 is rejected under 35 U.S.C. 103(a) as being unpatentable over Cekic et al. (6,505,948) in view of Zou et al. (6,550942) and further in view of Juliano (3,787,238) as applied to claims 1-7 above, and further in view of Hanelt et al. (5,827,449).

Cekic discloses a lamp having a UV light source and a transparent substrate (116), but lacks disclosure of the structure of the reflector, and whether its reflective properties are a result of a reflective coating, and further lacks disclosure of a polymer formed on the phosphor layer.

Zou teaches a reflective layer formed of a macromolecular polymer mixed with titanium dioxide in order to improve reflectivity of UV light.

Cekic further lacks disclosure of a polymer formed on the phosphor coated on the substrate.

Juliano teaches a polymer coating in order to protect the phosphor from damage from water or abrasion.

Cekic, Zou and Juliano lack disclosure of the type of material forming the transparent substrate.

Hanelt teaches that a material such as quartz glass can be used to form transparent layers (column 21, line 13).

Therefore it would have been obvious to one having ordinary skill in the art at the time of the invention to modify the flat lamp disclosed by Cekic to have multiple light sources in order to increase the intensity of the light emitted from the lamp, to further modify it to have a reflective layer formed of a polymer mixed with titanium dioxide in order to increase the reflectivity of the reflecting plate, as taught by Zou, and to thereby improve the efficiency of the lamp, to further modify it with a polymer coating on the phosphor layers in order to protect them from damage, as taught by Juliano, and to further modify it to have a transparent window substrate made of a material such as quartz glass, as taught by Hanelt, in order to provide a material that is well understood and readily available.

14. Claim 13 is rejected under 35 U.S.C. 103(a) as being unpatentable over Cekic et al. (6,505,948) in view of Zou et al. (6,550942) and further in view of Juliano (3,787,238) as applied to claims 1-7 above, and further in view of Troxell (5,646,479)

Cekic discloses a lamp having a UV light source and a transparent substrate (116), but lacks disclosure of the structure of the reflector, and whether its reflective properties are a result of a reflective coating, and further lacks disclosure of a polymer formed on the phosphor layer.

Zou teaches a reflective layer formed of a macromolecular polymer mixed with titanium dioxide in order to improve reflectivity of UV light.

Cekic further lacks disclosure of a polymer formed on the phosphor coated on the substrate.

Juliano teaches a polymer coating in order to protect the phosphor from damage from water or abrasion.

Cekic, Zou and Juliano lack disclosure of the type of material forming the transparent substrate.

Troxell teaches that a material such as a sodium-containing glass can be used to form transparent layers (column 4, line 57).

Therefore it would have been obvious to one having ordinary skill in the art at the time of the invention to modify the flat lamp disclosed by Cekic to have multiple light sources in order to increase the intensity of the light emitted from the lamp, to further modify it to have a reflective layer formed of a polymer mixed with titanium dioxide in order to increase the reflectivity of the reflecting plate, as taught by Zou, and to thereby improve the efficiency of the lamp, to further modify it with a polymer coating on the phosphor layers in order to protect them from damage, as taught by Juliano, and to further modify it to have a transparent window substrate made of a material such as a sodium-containing glass, as taught by Troxell, in order to provide a material that is well understood and readily available.

15. Claim 14 is rejected under 35 U.S.C. 103(a) as being unpatentable over Cekic et al. (6,505,948) in view of Zou et al. (6,550942) and further in view of Juliano (3,787,238) as applied to claims 1-7 above, and further in view of Vanderwerf (5,092,672).

Cekic discloses a lamp having a UV light source and a transparent substrate (116), but lacks disclosure of the structure of the reflector, and whether its reflective properties are a result of a reflective coating, and further lacks disclosure of a polymer formed on the phosphor layer.

Zou teaches a reflective layer formed of a macromolecular polymer mixed with titanium dioxide in order to improve reflectivity of UV light.

Cekic further lacks disclosure of a polymer formed on the phosphor coated on the substrate.

Juliano teaches a polymer coating in order to protect the phosphor from damage from water or abrasion.

Cekic, Zou and Juliano lack disclosure of the type of material forming the transparent substrate.

Vanderwerf teaches that material such as borosilicate glass can be used to form transparent layers (column 3, line 55).

Therefore it would have been obvious to one having ordinary skill in the art at the time of the invention to modify the flat lamp disclosed by Cekic to have multiple light sources in order to increase the intensity of the light emitted from the lamp, to further modify it to have a reflective layer formed of a polymer mixed with titanium dioxide in order to increase the reflectivity of the reflecting plate, as taught by Zou, and to thereby

improve the efficiency of the lamp, to further modify it with a polymer coating on the phosphor layers in order to protect them from damage, as taught by Juliano, and to further modify it to have a transparent window substrate made of a material such as borosilicate glass, as taught by Vanderwerf, in order to provide a material that is well understood and readily available.

16. Claim 15 is rejected under 35 U.S.C. 103(a) as being unpatentable over Cekic et al. (6,505,948) in view of Zou et al. (6,550942) and further in view of Juliano (3,787,238) as applied to claims 1-7 above, and further in view of Yang et al. (CN 1425621 A).

Cekic discloses a lamp having a UV light source and a transparent substrate (116), but lacks disclosure of the structure of the reflector, and whether its reflective properties are a result of a reflective coating, and further lacks disclosure of a polymer formed on the phosphor layer.

Zou teaches a reflective layer formed of a macromolecular polymer mixed with titanium dioxide in order to improve reflectivity of UV light.

Cekic further lacks disclosure of a polymer formed on the phosphor coated on the substrate.

Juliano teaches a polymer coating in order to protect the phosphor from damage from water or abrasion.

Cekic, Zou and Juliano lack disclosure of the type of material forming the transparent substrate.

Yang teaches that material such as a lead-sodium-silicate glass can be used to form transparent layers that attenuate radiation (Basic-Abstract).

Therefore it would have been obvious to one having ordinary skill in the art at the time of the invention to modify the flat lamp disclosed by Cekic to have multiple light sources in order to increase the intensity of the light emitted from the lamp, to further modify it to have a reflective layer formed of a polymer mixed with titanium dioxide in order to increase the reflectivity of the reflecting plate, as taught by Zou, and to thereby improve the efficiency of the lamp, to further modify it with a polymer coating on the phosphor layers in order to protect them from damage, as taught by Juliano, and to further modify it to have a transparent window substrate made of a material such as a lead-sodium-silicate glass, as taught by Yang, in order to provide a substrate that attenuates radiation.

Conclusion

17. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. If the applicant wishes to review a former patent on a flat lamp having multiple UV light sources, including lamp tubes and LEDs, USPN 6,639,349 is cited of interest.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Sharlene Leurig whose telephone number is (703)305-4745. The examiner can normally be reached on Monday through Friday, 8:30am-5:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nimesh Patel can be reached on (703)305-4794. The fax phone number for the organization where this application or proceeding is assigned is (703)308-7382.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703)308-0956.

Sharlene Leurig

VIP PATEL
PRIMARY EXAMINER